

PATENT APPLICATION PAPERS

OF

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FOR: MULTI-FUNCTION PORTABLE CELLULAR PHONE

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## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention provides a conventional portable cellular phone modified to incorporate a security alarm, radio receiver and other functions.

### 2. Description of the Prior Art

The portable cellular phone has found wide public acceptance since its commercial introduction. The ease in which communications between the user and the call recipient can be accomplished has extended its use in areas not heretofore contemplated. For example, United States Patent No. 5,555,286 to Tendler discloses a cellular phone system in which the cellular phone is utilized for transmitting signals in natural speech, the signals indicating the position of a vessel, vehicle or an individual upon system activation from the cellular phone keyboard or from a remote source. United States Patent No. 5,043,736 to Darnell et al. discloses a device that can be used as a cellular telephone and portable global position system and provides latitude and longitude information to a base unit display; United States Patent No. 5,081,667 to Drori et al, discloses a system for integrating cellular communication systems with vehicle security systems; U.S. Patent No. 5, 515, 043 to

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Berard et al, which utilizes a cellular phone handset in a system for tracking the position of a vehicle, and U. S. Patent No. 5,515,419 to Sheffer discloses a system for tracking a portable or mobile phone and include means for generating an emergency signal on detection of an emergency condition and transmitting the emergency signal to a remote monitoring station. The Sheffer system includes a portable phone unit which is similar to a conventional portable phone but which incorporates the hardware or software necessary to generate and transmit the necessary emergency signal should the user push the panic button.

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a The above patents disclose various forms of position locating/alarm systems utilizing cellular phones and while useful for the <sup>functions</sup> ~~functions~~ they disclose, are beyond the financial <sup>resources</sup> ~~resources~~ of the average consumer. However, the portability of cellular phones and the fact that the phones and the connection service therefor are relatively inexpensive, makes the cellular phone system useful for other, less expensive functions. For example, a cellular phone user may be travelling and want a separate alarm system placed in his/her hotel room. Or the user desires to have a radio receiver associated within the phone housing so that radio programs could be heard when the telephone is not in use. Other functions capable for use with the cellular phone but not currently available include the capture and storage of images and audio signals.

What is thus desired is to provide a multi-function, portable cellular phone modified to incorporate in a first

embodiment an alarm sensor, and an image capture and storage device in the same housing, a second embodiment incorporating an AM/FM radio receiver, the cellular phone, in both embodiments, being activated by keyboard or by voice control, activation of the cellular phone causing the automatic dialing of a pre-coded phone number, such as an emergency service (police) and home.

#### SUMMARY OF THE PRESENT INVENTION

The present invention provides a multi-function portable cellular phone modified to incorporate features that enhance the utility of the phone, and in particular provides a portable and lightweight security system.

In a first embodiment, the cellular phone is modified to incorporate an alarm, camera (image) and audio capture functions in the same housing. In a second embodiment, the cellular phone is modified to incorporate an alarm, radio, camera and audio capture in the same housing.

Using the cellular phone in the manner described hereinabove provides a relatively inexpensive technique for proving a multi-function device that is portable and relatively inexpensive and includes a security alarm system which provides a local alarm and also an alarm signal to a remote emergency service.

#### DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention as well as other objects and further features thereof, reference is made to the

following description which is to be read in conjunction with the accompanying drawing wherein:

FIG. 1 is a perspective view of a first embodiment of a portable cellular phone modified in accordance with the teachings of the present invention without a radio receiver;

FIG. 2 is a system block diagram of the modified cellular phone shown in Figure 1 in accordance with the teachings of the present invention;

FIG. 3 is a perspective view of a second embodiment of a portable cellular phone modified in accordance of the present invention with a radio receiver;

FIG. 4 is a system block diagram of the modified cellular phone shown in Figure 3 in accordance with a second embodiment of the present invention;

FIG. 5 illustrates the use of the modified portable cellular phone as an alarm device in a vehicle wheel cover;

FIG. 6 illustrates the use of the modified portable cellular phone as an alarm device on a door; and

FIG. 7 is a simplified block diagram of a single battery source for supplying power for the cellular phone functions.

#### DESCRIPTION OF THE INVENTION

Referring now to Figure 1, a perspective view of a first embodiment of a cellular phone 8, modified in accordance with the teachings of the present invention, is illustrated.

Portable cellular phone 8 having housing 10 is of conventional design and has the standard dialing and receiving

f functions with SEND button 9, antenna 11, keypad 12, display 13, microphone 14, and speaker 15. In accordance with the teachings of the present invention, phone 8 is modified to incorporate alarm sensors 16, sound (horn) device 17, a two step camera switch button 18, <sup>with</sup> two audio beeps indicating that an image/camera sensor 19, is on for normal use, a two step alarm switch 20 which, when pressed once in case of an emergency, the alarm and image and recording functions being activated and two beeps being sounded, switch 20 acting as a panic button ~~(symbol 20)~~ when pressed once, a television/personal computer connection output jack 21 for viewing/listening to the stored audio signals and images, phone/radio jack 22, receiver 23 and microphone 24.

As will be explained hereafter in more detail with reference to Figure 2, sensors 16 are adapted to detect movement such as motion, infrared and ultrasonic sensors. This is particularly useful if the phone 8 is mounted on a door 25 in a hotel room for example, as shown in Figure 6, when a user is traveling. In this case, detection of movement triggers sound device 17 via a horn within the cellular phone housing 10 to notify the cellular phone user and/or to scare off potential intruders (panic button 20 can also be depressed as will be described hereinafter). The alarm, in conjunction with a modem built into phone 8, signals remote emergency services, such as the police, using a conventional wireless communication system thereby notifying the service of an emergency situation in the manner described in the aforementioned Sheffer patent.

The ear phone, or receiver, portion 23 enables a user to hear audio alarm signals transmitted by the phone 8 and microphone 24 enables a user to talk through the cellular phone 8 without being limited to the mouthpiece portion of the cellular phone 8 while also functioning as a radio telephone in a vehicle.

Figure 2 is a block diagram of the system shown in Figure 1, the components shown all being mounted within housing 10. The SEND button 9 is configured so that it is triggered when sensors 16 are activated or from the panic button 20 provided on phone 8. Sensors 16 have an arming control 40 associated therewith which is activated when exiting a vehicle or area and is activated by depressing key 20 twice. An indicator can be provided to show that the system has accepted the arming command.

When sensors 16 are triggered, audio storage (capture) 44 and video storage (capture) 46 are initiated to render transmittable replicas of the intrusion sounds and images over the cellular phone 8 to a central office via available wireless communication systems. In this way, the image of the intruder can be reported to the police, and the alarm also verified.

A modem 48 is wired into the external microphone and speaker jack 22 to allow transmission of the captured, or stored, video and audio signals. The audio can be played back directly through microphone input 14 without going through modem 48. The modem 48 can be bypassed for audio, but is necessary for image data. Further, the audio can be maintained as an input after the intrusion sounds and images have been transmitted. Random images

can be transmitted after the initial rendering of the intrusion data. Thus, if the vehicle is stolen, the sound and images can be monitored to get an idea of the whereabouts of the vehicle and if the thief is still towing the car.

a As shown in Figures ~~2 or~~ 4, AM/FM radio receivers can optionally be included for entertainment when the alarm system is not in use. The alarm and radio function components can be mounted on the same printed circuit board within housing 10 or on separate circuit boards.

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a The intrusion sounds and images are sent when the sensors 16 detect movement of the vehicle (or persons when in a hotel room) but only when switch 20 has been depressed twice ~~(symbol 20)~~ to arm the system or when depressed once to function as a panic key.

The panic mode of key 20 can also be adapted to initiate the capture of video (or pictures), via camera 50 and audio in non-alarm situations when the key is pressed once, the audio signals and images being recorded (stored) for later transmission when SEND button 9 is depressed; if key 20 is pressed twice in succession or maintained depressed for a predetermined period of time, the panic mode will be implemented and the intrusion pictures taken along with sound. Phone 8 is then activated to automatically dial and send the collection of recorded (stored) sounds and images to a remote central office for processing and response as described hereinabove.

A sound device 52 is connected to alarm sensors 16 and is



used in the panic mode.

In accordance with another feature of the present invention, battery pack power source 54 is mounted to housing 10 and provides power to phone 8, alarm sensors 16, radio receiver 60 (Figures 3 and 4), image capture device 46 and camera device 50. Using a single battery source for phone 8 and the added functions allows the modified phone 8 to be reduced in size and manufactured in a more economical manner.

The embodiment shown in Figure 2 and 4 is substantially identical to the embodiment shown in Figures 1 and 3 with the exception that a radio receiver 60 is added. In particular, and referring to Figure 3, housing 10 further includes radio receiver volume control 61, AM/FM switch 62 and radio station control switch 64. Radio receiver 60 can be used when the alarm function is deactivated. In addition, lead 55 connects audio capture 44 to jack 22, allowing a captured conversation to be recorded. Lead 57, also connected to audio capture 44, allows two way conversations to be recorded, whether via telephone conversations between the cellular phone user and a third party or conversations of persons present near phone 8 (similar to a conventional recording device).

Figure 5 shows another use for the modified cellular phone 8. In particular, phone 8 is mounted on the anti-theft wheel cover described in United Patent No. 5,540,067 to provide an additional technique for preventing theft of a vehicle or tracking the vehicle if it is stolen. The teachings of the '067

patent necessary for an understanding of the present invention are incorporated herein by reference.

The present invention thus provides a conventional portable cellular phone modified to incorporate other useful functions relatively inexpensively and which has many practical applications in addition to those described hereinabove.

While the invention has been described with reference to its preferred embodiment, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the true spirit and scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teaching of the invention without departing from its essential teachings.